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TITLE OF THE INVENTION (500 characters max)

CHILDREN'S COMPUTER KEYBOARD

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ENCLOSED APPLICATION PARTS *(check all that apply)*

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☐ Application Date Sheet. See 37 CFR 1.76

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☑ Applicant claims small entity status. See 37 CFR 1.27.

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☑ No.

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Respectfully submitted,

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Date January 6, 2004

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PROVISIONAL PATENT APPLICATION

CHILDREN'S COMPUTER KEYBOARD

The present invention is keyboard designed for children. The inventive keyboard is in a standard QWERTY layout but includes several design features that allow the keyboard to be more easily used by children. With existing keyboards all of the keys are similar in color making it very difficult for a child to learn the function and locations. In contrast with reference to Figure 1, the inventive keyboard has color coded keys. The various keys are grouped by color with similar keys based upon their primary functions. Because the keys are grouped by functionality, the child will learn more easily learn the purpose and location of each key by using the inventive keyboard.

The vowel keys may be a first color which is distinct from the color of all the other letter keys. In an embodiment, the vowels A, E, I, O and U are distinct in color from the other keys. This contract allows the child to more easily find the vowels which are used in nearly all English words. Because the vowels are more easily located, the child will be able to learn the locations of these letters first which will result in faster typing. After the locations of the vowels are determined, the child can then learn the locations of the other letter keys and learn to touch type. In an embodiment, the vowels may be red.

The consonant letter keys are a color that is distinct from the vowels and numbers. By grouping the consonants together in one color the child will more easily learn the locations of these letters and understand that most words are spelled by using combinations of consonants (orange keys) and vowels (red keys). The symbols to the right of the numbers including "- / _", "= / +", "\ / |" may also be orange.

In order to distinguish the number keys from the letter keys, the numbers are a distinct color from the consonant letter keys. Because the numbers are a different color than the consonant keys, the child will be reminded that the number keys are not letters. To further distinguish the letter from the numbers the number keys are physically separated from the letter keys by a strip of space in the keyboard. This contract in color and physical separation are intended to teach the child that letters and numbers are very distinct in usage.

The typing control keys such as the Enter key may also be in a color that is a strong contrast to the number and letter keys. The enter key may be purple. This color contrast is intended to again distinguish the enter key from all other keys and assist in teaching the child where the enter key is located. When a child is learning to use a computer, the enter key can be located by telling the child to press the rectangular purple key. In the illustrated embodiment of the keyboard, the cursor arrow keys are also purple.

The other functional keys, e.g. shift, backspace, tab and cap lock may be blue which is also a strong color contrast to the other keys. These keys are grouped together because they have similar functions. More specifically, when pressed each of these keys does not result in anything being typed into the computer, but they each have a special function. By using a distinct color the child will more easily learn that these keys have similar functions.

In addition to the special coloring of the keys of the inventive keyboard, the text on each of the keys may have special significance. As also illustrated in Fig. 1, the text identifying the keys are in a high contrast color that is easily read against the key colors. These colors may also assist in teaching the child how to type specific symbols. In the preferred embodiment, the symbols which are actuated by pressing the shift key and a number key are printed on the keys in a color that matches the shift key. Similarly, the colors of all shift actuated punctuation marks also match the color of the shift key lettering. For example, the shift and symbol text may be a dark blue color. Because these colors match, the child will be reminded that the shift key needs to be pressed in order to type the symbol or punctuation mark. The text for the keys that are not text color coded may be a dark gray or black for light color keys and a white or yellow for dark color keys.

In an embodiment, the keys may have lights which are illuminate the entire keyboard or only illuminate the individual keys when the key is pressed. When the shift

key is depressed, the symbol text on the number keys may be illuminated so that the child will know that pressing the shift key will result in a symbol being typed. In this embodiment, small lights under the keys may be illuminated when the shift key is pressed and the light may pass through the translucent symbol portion of the keys. In yet another embodiment, the keys may have a glow in the dark material which allows the child to identify the keys in the dark.

As discussed, the keyboard is designed for a child's hand rather than an adult hand. As discussed, the spacing of the keyboard keys allows children and users with small hands to more easily reach the desired keys. In an embodiment, the overall inventive dimensions of the keyboard are proportional to the average sized child's hand. Table 1 lists average dimensions of various hand parameters of children 4, 6 and 8 years of age. Table 1 also lists the average dimensions of an adult hand for comparison. Note that the dimensions of the adult male hand are approximately 68 %, 48 % and 35 % greater than average 4, 6 and 8 year old children's hands respectively. The hand dimensions of Table 1 are inches. Figure 5 illustrates where the listed dimensions are measured on a hand. In order to accommodate the smaller dimensions of children's hands, the size and spacing of the inventive keyboard can be proportionally smaller than an adult keyboard.

	4 year old child	6 year old child	8 year old child	Adult male
Hand length	4.6	5.1	5.6	7.5
Hand Breadth	2.1	2.3	2.5	3.5
Index finger length	2.6	2.9	3.2	4.5
Dorsum length	1.8	2.2	2.4	3.0
Thumb length	1.6	1.8	2.0	2.7

Table 1

The width of the inventive keyboard is approximately 16 inches. In contrast, a typical adult keyboard is approximately 17 inches in width. The rounded key top enables the child to more easily hit the keys appropriately and less likely for the child to hit an adjacent key. The inventive keyboard is easier for a child to use because it is more easily handled by the child, more intuitively organized and has a better fit with the child's hands.

The body of the keyboard may be a simple rectangular structure with rounded corners and adjustable feet at the front of the keyboard that allow the angle of the keyboard to be adjusted. The perimeter of the keyboard may have a rounded edge and curves which remove any sharp corners or sharp edges which may cause injury if the keyboard is dropped onto a limb. The keys of the keyboard are positioned away from the edges so that there is one or more inches of border between the keys and the edge of the keyboard. This border allows the child to easily grasp the keyboard and move it without depressing any of the keys.

The keyboard may include an integrated speakers and microphone. The speaker may be within the keyboard shell under the boarder areas. The speaker unit may be mounted under a perforated area of the keyboard surface so that the sound produced by the speaker may be emitted easily. Similarly, the microphone may also be mounted under a perforated area of the keyboard so that it can easily detect sounds produced by the child. The keyboard may also have jacks for a microphone/speaker headset or an external audio components. The jacks allow the headset to be plugged directly into the keyboard rather than into the computer.

In an embodiment, the keyboard may have an integrated digital camera. The camera may be mounted within the keyboard with a lens that can be adjusted to change the direction and angle of the lens. The direction of the camera can be manually adjusted so that it points directly at the user's face. The lens may also be adjustable so that the camera can capture a wide or narrow angle. Because the keyboard may not be the optimum vantage point, an adjustable arm with a small camera on the end may extend from the keyboard. The arm allows the camera to be positioned at any desired location so that the desired camera angle can be obtained. The arm may retract into a slot in the keyboard when not in use.

In addition to the color scheme of the keys, the body of the keyboard may also have various colors, solid or patterned colors which may also include drawings or graphical designs. These designs and colors may be related to a theme, program or a

specific institution. For example, if the product is used associated with a television show, the graphics of the television characters may be printed on the boarder space of the keyboard. The keyboard may be packaged with various stickers which would allow the child to personalize the keyboard. For example, a set of letters or names as well as other graphics representing the interests of the child can be applied to the borders of the keyboard.

Special software may be used with the inventive keyboard to assist children in learning how to learn to use the keyboard. The software may be integrated into the keyboard as firm ware or installed on the computer as a keyboard driver. For example, a common problem that children have with learning to type is that the keys can repeat if the key is not released quickly after being pressed. In an embodiment, the inventive keyboard has software which prevents the letter keys from being repeated. Some keys are normally repeated such as the space bar or lines. In an embodiment, the number, letter, punctuation and most symbol keys cannot be repeated even when the keys are held down. Only the underscore and dash symbols can be repeated by holding the keys down. By eliminating the repeat feature, the child will be less likely to accidentally make typing errors due to not releasing the key.

In an embodiment, a program reacts to the keystroke by emitting a sound. The sound may be a simple short note, tone or sound. The sounds may be distinguished by the type of key being pressed. For example, the letters may have a first sound, the

numbers may have a distinct second sound and non-typed keys may have a third sound. The upper case letters may also have a distinct sound from the lower case letters.

Alternatively, the system may emit the sound of the letter being typed. This provides the child with an audible confirmation of the specific keystroke and will assist the child in learning to type without looking at the keys. In another embodiment, the keyboard or computer may have spelling software which is actuated after one or more letters are typed followed by the space bar. When the space bar is pressed, the program checks the previously typed group of letters and emits the sound of the word that has been typed through a voice synthesizer. The system may ignore marks such as commas, periods, quotations, semicolons, etc. which were typed before the space bar. This way the child can type and listen for the audible words from the computer as confirmation that the words are spelled correctly.

In an embodiment, the software may read back the entire sentence that has been typed after the period key has been pressed. Frequently the pronunciation or intonation of the words will vary depending upon the punctuation and how the words are used in the sentence. In this embodiment, the system interprets the words and punctuation to determine how the sentence should be spoken. By providing the correct inflection in the voice the sound of the sentence will be more natural than simply stating each word that is typed.

In yet another embodiment, the system may have a spell checking feature which produces a visual or acoustic signal to confirm that the word has been typed correctly. If the word that is typed by the child is not recognized, the system may produce a distinct visual or acoustic signal. Some words have common misspellings which are recognizable. In an embodiment, the system may recognize the misspelled word and suggest the correct spelling. For example, if the child types the word "aple", the system may say "did you mean apple?" The child can then say "yes" or push a confirmation button to indicate that that the intended word being typed is apple. Alternatively, the child can say "no" or push a rejection button indicating that apple was not the intended word. The system may respond by suggesting a second word having a similar spelling, "Did you mean ape?"

The voice produced by the system may be changeable depending upon the character selected. For example, if the keyboard has the theme of a well known cartoon character, the synthesized voice of the keyboard system may match the recognized cartoon character's voice. This familiarity will help the child become comfortable with using the computer.

In another embodiment, rather than or in addition to the word being spoken, the computer may produce a sound associated with the word that has been typed. For example, if the word "DOG" is typed into the system, the computer may produce a dog's

barking sound rather than saying "DOG." Animal sounds associated with the type of animal word typed may be produced when the words are recognized by the system.

Another problem that with children using computers is that they can accidentally damage a computer by accessing or deleting certain program and data files. In an embodiment, the inventive keyboard may prevent the child from accessing or damaging the computer by applying a setting that disables all but the most basic program functions. In particular, when the keyboard is in a safe mode the "delete", "replace", "save as", all controls and any similar functions are completely disabled. By setting the keyboard to the save mode, the child can freely do any typing without causing any damage or make any functional changes to the computer, documents or software.

In an embodiment, the keys may be customized with "skins" which are thin plastic pieces which are attached to the keys. The skins may be held to the keys with an adhesive, plastic tabs or small magnets which are in the keys and skins. The skins may also be made of a soft material or a rubber material that resists the child's fingers from slipping off.

The skins may have pictures, patterns, textures, icons, game specific icons, etc. An example of a picture used with each key is the "A" key may have the letter A and a picture of an alligator. When the child sees the alligator picture he or she will associate the key with the word alligator and know that this is the "A" key. In another

embodiment, the keys may have the raised Braille markings associated with the underlying keys.

The inventive keyboard may be connected to the computer via a cable which has a plug which connects directly to the computer. The plug may be a dedicated PS/2 keyboard plug or a USB type plug. The keyboard is compatible with the various operating systems including: Windows 95, 98, 2000, Windows XP and all Apple Macintosh operating systems. Alternatively, the keyboard may have a wireless transmitter which transmits the keystroke signals as they are typed to a receiver which is connected to the computer. Examples of wireless communications include radio frequency (RF) or infrared.

In the foregoing, a computer keyboard system has been described. Although the present invention has been described with reference to specific exemplary embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention as set forth in the claims. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

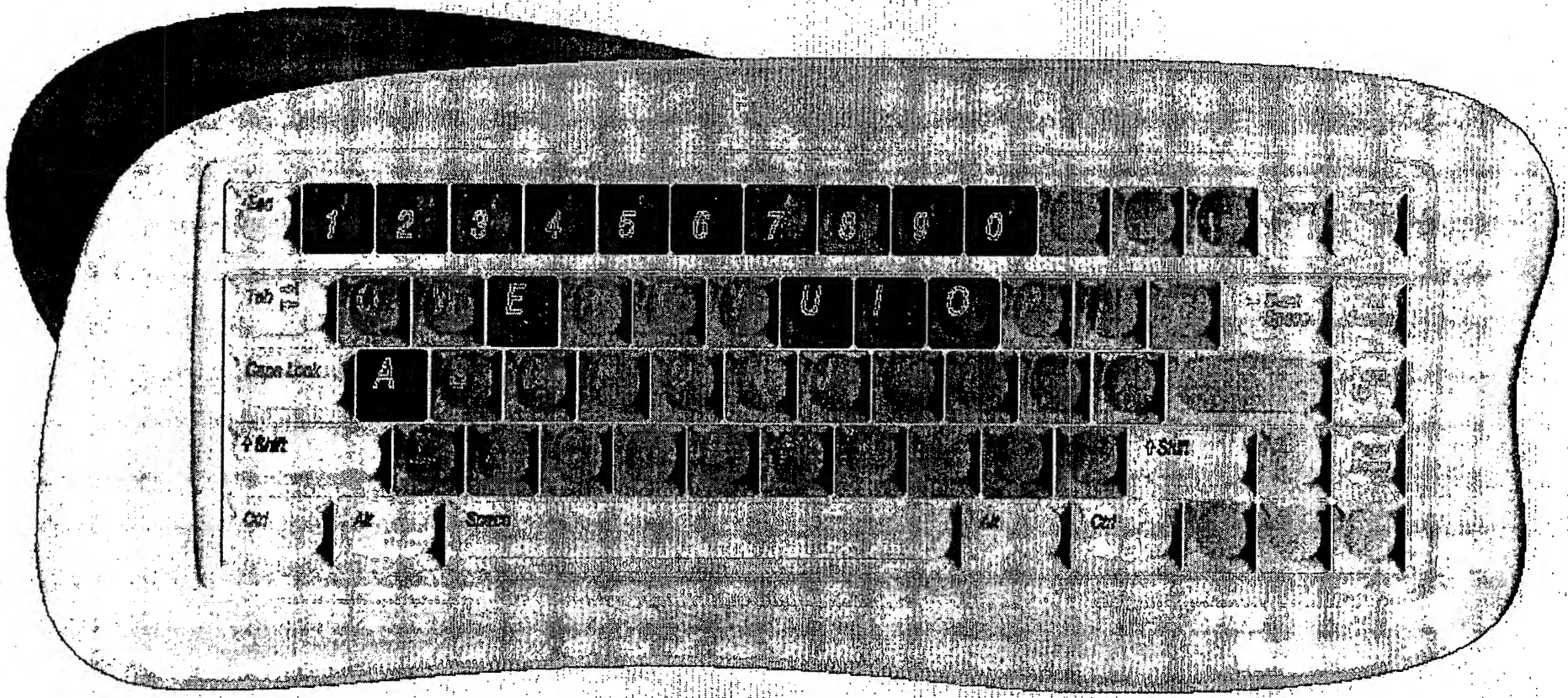
Esc
1
2
3
4
5
6
7
8
9
0
Tab
E
U
I
O
Caps Lock
A
Shift
Ctrl
Alt
Space
Alt
Ctrl

FIG_1

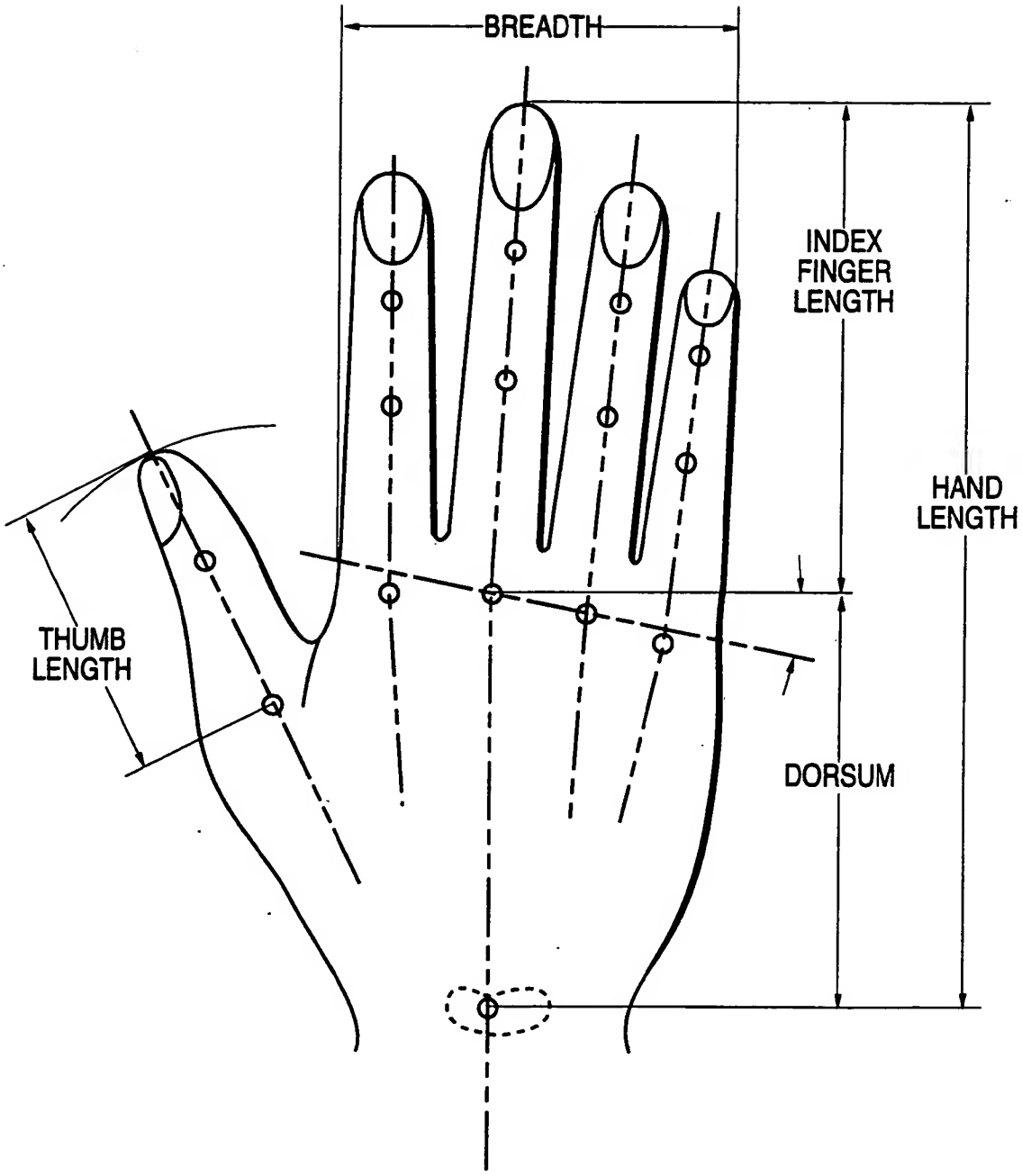
BREADTH
INDEX FINGER LENGTH
HAND LENGTH
THUMB LENGTH
DORSUM

FIG. 2

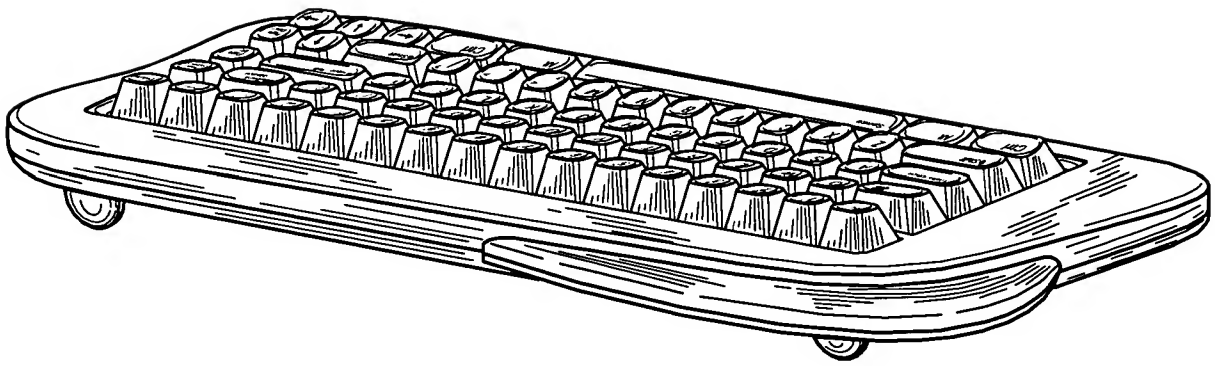

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

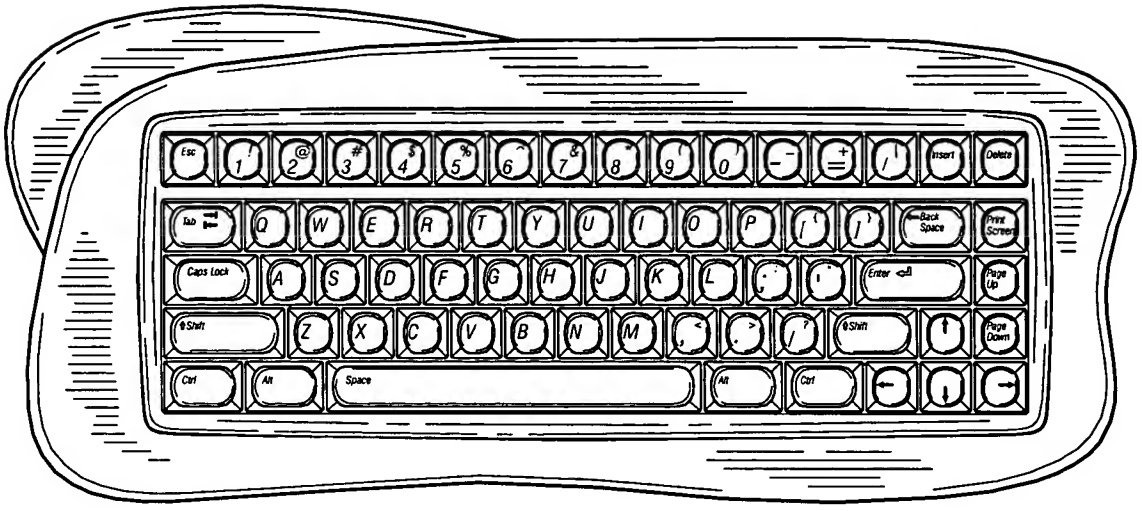
Esc
Insert
Delete
Back Space
Print Screen
Caps Lock
Enter
Page Up
Shift
Shift
Page Down
Ctrl
Alt
Space
Alt
Ctrl

FIG. 6

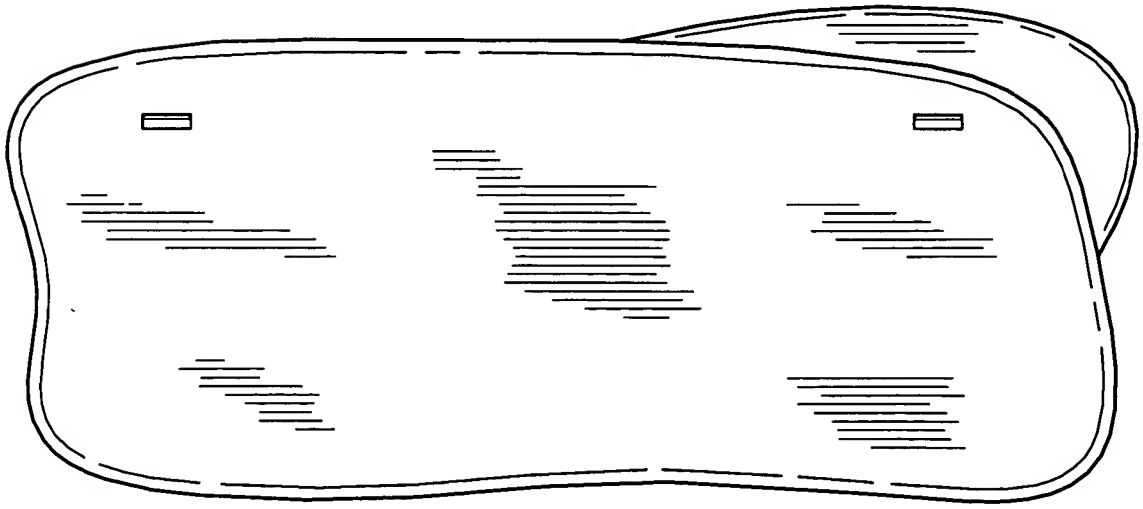

FIG. 7